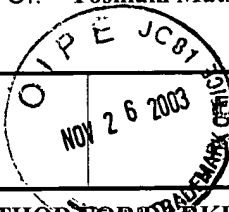


TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
YKI-0080

In Re Application Of: Yoshiaki Matsuura et al.

Serial No.
09/995,135



Filing Date
11/27/2001

Examiner
Minh Toan T. Ton

Group Art Unit
2871

Invention: METHOD FOR DARKENING PIXEL

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on September 22, 2003

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Patricia A. Hart

Typed or Printed Name of Person Mailing Correspondence

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT: YOSHIAKI MATSUURA ET AL.)
SERIAL NO.: 09/995,135) Group Art Unit: 2871
FILED: November 27, 2001) Before the Examiner:
FOR: METHOD FOR DARKENING PIXEL) Minh Toan T Ton

APPEAL BRIEF

1. THE REAL PARTY IN INTEREST

The real party in interest in this appeal is Sanyo Electric Co., Ltd. Ownership by Sanyo Electric Co., Ltd. is established by an assignment document recorded for this application on November 27, 2001 on Reel 012336 Frame 0729.

2. RELATED APPEALS AND INTERFERENCES

Appellant knows of no related patent applications or patents under any appeal or interference proceeding.

3. STATUS OF CLAIMS

Currently, claims 1-8 are pending. All pending claims stand rejected under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a).

4. STATUS OF AMENDMENTS

There have been no amendments filed subsequent to receipt of the final office action.

5. SUMMARY OF INVENTION

Referring to Figures 1-4 of the application, the invention relates to a method for darkening a pixel. In order to understand the invention, some background information may be helpful.

Liquid crystal display (LCD) devices are flat display devices, which have advantages such as a low dissipation power and a thin structure, and therefore, they are widely utilized as display devices for various electrical appliances. In particular, LCD devices of an active matrix type have a thin film transistor that is disposed corresponding to each of pixels arranged in a matrix state and which controls the display of the corresponding pixel by turning this thin film transistor ON and OFF.

However, in such an LCD of the active matrix type, if a defect, for example, leakage current, occurs in the thin film transistor during a manufacturing process, the display of this pixel is impossible. Furthermore, also owing to short circuit of a supplemental capacitive electrode and a supplemental capacitive line, the display of this pixel is impossible, and as such, a defect of one pixel unit (a point defect) occurs.

In the case of such a defect of one pixel unit, if this point is a dark point (black), it is not noticeable, but if this point is a bright point (white) and if the pixel is surrounded with black pixels, there is a problem that the defective pixel is very noticeable. Accordingly, it is desirable to darken the defective pixel.

The invention provides a method for effectively darkening an operationally defect pixel. In particular, referring to Figures 1 and 3, illustrate a pixel that has been darkened

according to the invention. In particular, a plurality of data lines 10 in a vertical direction and a plurality of gate lines 12 in a horizontal direction are disposed with a predetermined space between them, and a range surrounding these lines defines one pixel. The pixel has a thin film transistor 24 that includes a polycrystalline silicon layer 20, which is connected to a pixel electrode 28 via a contact 26. The polycrystalline silicon layer 20 is formed integrally with a supplemental capacitor electrode 32.

When a defect occurs in the pixel, a part of the pixel electrode 28 is cut (see the cut area 50) by a laser in the vicinity of the contact 26 connecting the polycrystalline silicon layer 20 to the pixel electrode 28 to separate the contact 26 from the pixel electrode 28. The cut allows the thin film transistor 24 to be electrically cut from the pixel electrode 28 and the supplemental capacitor 32. When this occurs, the application of a voltage to the pixel electrode can be prevented, which darkens the pixel.

Accordingly, for the finished liquid crystal display, a display test for each pixel is made. When the defective pixel is found in this test, the pixel is subjected to the processing of darkening by laser repairing. Moreover, also in the case where a short occurs on a supplemental capacitive line, the voltage of supplemental capacitive line can be reliably prevented from being applied to a data line via the thin film transistor.

6. ISSUES

There are two issues on appeal: (1) whether the Examiner's rejection of claims 1-8 under 35 U.S.C. § 102(e) as being anticipated by Iizuka et al. (U.S. 6,515,720) ("Iizuka"); and whether the Examiner's rejection of claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Wakai et al. (U.S. 5,166,085) ("Wakai") in view of Takahara (U.S. 6,219,113) is improper.

7. GROUPING OF CLAIMS

There are two groups of claims. Claims 1-8 comprise the first group, which stand or fall together, under the Examiner's contested rejection of these claims under 35 U.S.C. § 102(e) as being anticipated by Iizuka. Claims 1-8 also comprise the second group of claims, which stand or fall together, under the Examiner's contested rejection of claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Wakai in view of Takahara.

8. ARGUMENT

A. Claims 1-8 are not anticipated by Iizuka under 35 U.S.C. § 102(e).

Under the first grouping of claims, the Examiner improperly rejected claims 1-8 under 35 U.S.C. § 102(e) as being anticipated by Iizuka. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the * * * claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claims 1-8 include the following limitation: "a part of the pixel electrode is cut by a laser in the vicinity of the contact connecting an electrode of the thin film transistor to the pixel electrode to separate the contact from the pixel electrode and to thereby darken the corresponding pixel." Iizuka does not disclose that limitation.

The Examiner asserts that Iizuka discloses an active matrix LCD comprising: a pixel electrode formed on an insulating layer; the insulating layer formed on a thin film transistor; the pixel electrode connected to the thin film transistor via a contact hole through the insulating layer. The Examiner does not specifically refer to Iizuka's references numbers to illustrate which limitations are equivalent to Appellant's claimed invention. However, referring to Figure 3 of Iizuka, in order for the Examiner to meet some of the claimed limitations, the following equivalents would have to apply: a pixel

electrode 53 formed on an insulating layer 84; the insulating layer 84 formed on a thin film transistor 75; the pixel electrode 53 connected to the thin film transistor 75 via a contact hole 83B through the insulating layer 84. When using these equivalents, Iizuka does not disclose that a part of a pixel electrode 53 is cut by a laser.

At column 8, lines 8-28, Iizuka teaches that when a short circuit occurs between the storage capacitance line 52 and the storage capacitance electrode 61, a laser beam is radiated to the exposed part 80X (specification incorrectly refers to BOX) of the second coupling portion 80B (specification incorrectly refers to BOB) from the rear surface of the array substrate 86 to electrically cut the part 80X. Iizuka does not teach or suggest that a part of the pixel electrode 53 is cut. In fact, when looking at Figure 3, the cut does not occur anywhere near the pixel electrode 53. Iizuka explains that it is the storage capacitance line 52 that is electrically cut from the storage capacitance electrode 61.

Appellant respectfully submits that Iizuka does not disclose “a part of the pixel electrode is cut by a laser in the vicinity of the contact connecting an electrode of the thin film transistor to the pixel electrode to separate the contact from the pixel electrode and to thereby darken the corresponding pixel.” Accordingly, because Iizuka does not disclose all of the limitations of the claims 1-8, the rejection regarding claims 1-8 is improper.

B. Claims 1-8 are patentable over Wakai in view of Takahara under 35 U.S.C. § 103(a).

Under the second grouping of claims, the Examiner improperly rejected claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Wakai in view of Takahara. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; and that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Wakai and Takahara do not teach or suggest all of the limitations set forth in claims

1-8. Claims 1-8 include the following limitation: “a part of the pixel electrode is cut by a laser in the vicinity of the contact connecting an electrode of the thin film transistor to the pixel electrode to separate the contact from the pixel electrode and to thereby darken the corresponding pixel.”

The Examiner asserts that Wakai teaches “a pixel electrode 110 formed on an insulating layer 108; the insulating layer formed on a thin film transistor; the pixel electrode connected to the thin film transistor via a contact hole through the insulating layer.” The Examiner also asserts that Takahara teaches that “when a short-circuit defect occurs, a short-circuited portion is cut with a laser trimming unit, wherein the primary object of the point defect correction is to correct a white point defect to a black point defect” and that cutting off the thin film transistor and the pixel electrode from each other implies that the pixel electrode is cut in the vicinity of the contact. Appellant strongly disagrees with the Examiner’s assertions.

Column 71, lines 59-62 and Figure 93 of Takahara describe a method in which the YAG laser light 901 focuses directly on the thin film transistor 155 so the thin film transistor 155 is destroyed. Takahara does not teach or suggest cutting a part of the pixel electrode in the vicinity of the contact. Indeed, Takahara actually teaches away from cutting a part of the pixel electrode because Takahara specifically teaches to destroy the thin film transistor. In Appellant’s claimed invention, the thin film transistor is not destroyed.

Moreover, the claimed limitation of cutting at part of the pixel electrode is important. The cut is made to separate the contact from the pixel electrode and to thereby darken the corresponding pixel. As explained on page 8, line 29 of the specification, the location of the cut is important. When the TFT 24 side portion alone is cut, no effect is exerted in the case of the occurrence of a bright point by short of the supplemental capacitor line 34 and the polycrystalline silicon layer 20. Therefore, it is important that a part of pixel electrode 28 in the vicinity of the contact 26 is cut.

Thus, because Wakai and Takahara do not teach or suggest to cut a part of the pixel electrode in the vicinity of the contact and it is not obvious from either of the disclosure of

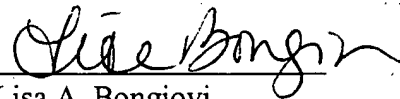
Wakai and Takahara to cut a part of the pixel electrode, Appellant respectfully submits that the rejection of claims 1-8 under 35 U.S.C. § 103(a) is improper.

E. Conclusion

For the reasons cited above, Appellant respectfully submits that the rejections are improper and request reversal of the outstanding rejections. If there are any additional charges with respect to this Appeal, or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Appellant's attorneys.

Respectfully submitted,

CANTOR COLBURN LLP

By: 

Lisa A. Bongiovi

Registration No. 48,933

CANTOR COLBURN LLP

55 Griffin Road South

Bloomfield, CT 06002

Telephone (860) 286-2929

Facsimile (860) 286-0115

Customer No. 23413

November 24, 2003

9. APPENDIX A

Appealed Claims

1. A method for darkening a pixel by darkening a defective pixel on a display for controlling the application of a voltage to a corresponding pixel electrode by a thin film transistor disposed for each pixel, wherein:

a pixel electrode is formed on an insulating layer which is provided on an electrode of the thin film transistor, and the electrode of the thin film transistor and the pixel electrode are connected via a contact formed through the insulating layer; and

a part of the pixel electrode is cut by a laser in the vicinity of the contact connecting an electrode of the thin film transistor to the pixel electrode to separate the contact from the pixel electrode and to thereby darken the corresponding pixel.

2. The method for darkening the pixel according to claim 1, wherein the electrode of the thin film transistor in the vicinity of the contact is further cut by the laser to separate the contact from the thin film transistor.

3. The method for darkening the pixel according to claim 1, wherein the display device is a liquid crystal display of a normally black type.

4. The method for darkening the pixel according to claim 1, wherein the pixel electrode on the contact is an island-like conductive portion separated from an ambience.

5. A display device for controlling, by the thin film transistor disposed for each pixel, the application of a voltage to a corresponding pixel electrode, wherein:

a pixel electrode is formed on an insulating layer which is provided on an electrode of the thin film transistor, and the electrode of the thin film transistor and the pixel electrode are connected via a contact formed through the insulating layer; and

a part of the pixel electrode is cut by a laser in the vicinity of the contact connecting an electrode of the thin film transistor to the pixel electrode to separate the contact from the pixel electrode and to thereby darken the corresponding pixel.

6. The display device according to claim 5, wherein the electrode of the thin film transistor in the vicinity of the contact is further cut by the laser to separate the contact from the thin film transistor.

7. The display device according to claim 5, wherein the display device is a liquid crystal display of a normally black type.

8. The display device according to claim 5, wherein the pixel electrode on the contact is an island-like conductive portion separated from an ambience.